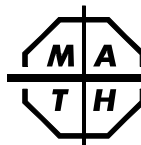


30.  $\frac{?}{?}$  is *not* the sum of the squares of 3 integers.  
A) 14 B) 21 C) 28 D) 35
31. If 9 months ago was January 1, then 90 months from now it will be  
A) March B) April C) May D) June
32. The sum of all positive integral factors of 32 is  
A) 5 B) 30 C) 32 D) 63
33. Jim has 12 socks: 4 red, 4 black, and 4 blue. Choosing in the dark, he wants at least one matching pair of socks that are *not* red. If he does not know what color socks he is choosing, then he must choose at least  $\frac{?}{?}$  socks to be sure he has a matching pair.  
A) 2 B) 3 C) 6 D) 7
34. A number between 0 and 1 is multiplied by a number between 1 and 2. Which of the following could *not* be the product?  
A) 0.25 B) 1 C) 1.75 D) 2.25
35. If  $A \diamond B$  means  $(A + B) \times (B - A)$ , then  $1 \diamond (2 \diamond 3) =$   
A) 35 B) 24 C) 2 D) 0
36.  $\frac{?}{?}$  could be the sum of 6 consecutive odd integers.  
A) 108 B) 111 C) 333 D) 345
37. I count the petals on my 20 flowers. The first 8 average 24 petals each. The next 12 average 34 petals each. What is the average number of petals on all 20 flowers?  
A) 28 B) 29 C) 30 D) 31
38. If 28 is a factor of the square of an integer, then another factor of the same square must be  
A) 784 B) 49 C) 20 D) 12
39. On July 1, Harry sold \$7 worth of lemonade. On July 2, he sold \$10 worth. Each day after that he sold \$3 more than he sold the day before. When did he first sell \$100 worth in a single day?  
A) July 30 B) July 31 C) August 1 D) August 2
40. My number is the square of an integer, the cube of an integer, and greater than 1. The least possible total number of positive divisors of my number is  
A) 7 B) 6 C) 5 D) 4



The end of the contest 8



## 2009-2010 Annual 8th Grade Contest

Tuesday, February 23 (Alternate date: February 16), 2010

8

## Instructions

- **Time** Do *not* open this booklet until you are told by your teacher to begin. You might be *unable* to finish all 40 questions in the 30 minutes allowed.
- **Scores** Please remember that *this is a contest, and not a test*—there is no “passing” or “failing” score. Few students score as high as 30 points (75% correct). Students with half that, 15 points, *should be commended!*
- **Results Posted Online** High-scoring contest results, both overall and regional, will be posted at *www.mathleague.com* no later than April 15.
- **Format, Point Value, & Eligibility** Every answer is an A, B, C, or D. Write answers in the *Answers* column. A correct answer is worth 1 point. Unanswered questions get no credit. You **may** use a calculator. You’re eligible for this contest only if you are in grade 8 or below and only if you don’t also take this year’s Annual 6th or Annual 7th Grade Contest.

## Please Print (to the student: you must complete all items below)

Last Name \_\_\_\_\_ First Name \_\_\_\_\_

School \_\_\_\_\_ Teacher \_\_\_\_\_ Grade Level \_\_\_\_\_

Time at Start of Contest \_\_\_\_\_ Today’s Date \_\_\_\_\_

## Do Not Write In The Space Below

## To the Teacher:

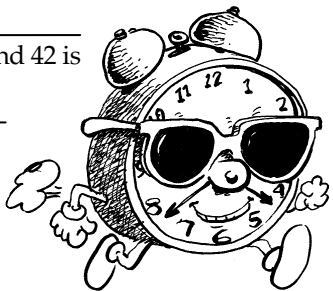
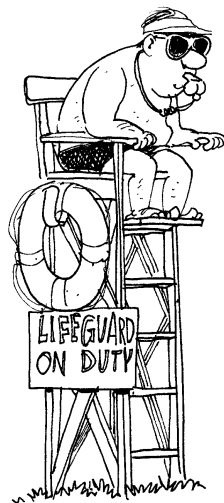
Please enter the score at the right before you return this paper to the student. *Papers with scores of 30 or higher must be held until June 1.* Student’s Score: \_\_\_\_\_

Fifteen books of past contests, *Grades 4, 5, & 6 (Vols. 1, 2, 3, 4, 5)*, *Grades 7 & 8 (Vols. 1, 2, 3, 4, 5)*, and *High School (Vols. 1, 2, 3, 4, 5)*, are available, for \$12.95 per volume (\$15.95 Canadian), from Math League Press, P.O. Box 17, Tenafly, NJ 07670-0017.

Visit our Web site at <http://www.mathleague.com>

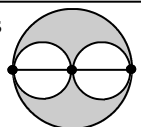
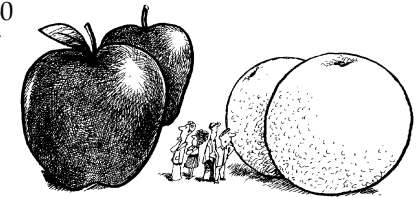
Steven R. Conrad, Daniel Flegler, and Adam Raichel, contest authors

1. 2010 is *not* divisible by  
A) 2    B) 3    C) 5    D) 7
2. 28% is equal to  
A) 2.8    B)  $\frac{7}{25}$     C) 2800    D)  $\frac{0.28}{100}$
3.  $\frac{4}{5} - \frac{3}{20} =$   
A)  $\frac{1}{15}$     B)  $\frac{2}{15}$     C)  $\frac{13}{20}$     D)  $\frac{12}{65}$
4. Al worked at the pool for 20% of the days in June. Al worked at the pool for ? days.  
A) 3    B) 6    C) 9    D) 12
5. In a triangle with an acute angle, an obtuse angle, and a  $60^\circ$  angle, the obtuse angle could be  
A)  $30^\circ$     B)  $90^\circ$     C)  $110^\circ$     D)  $120^\circ$
6.  $0.8 =$   
A)  $\frac{4}{5}$     B)  $\frac{5}{4}$     C)  $\frac{1}{8}$     D)  $\frac{8}{100}$
7. If the time 6000 seconds ago was 10:00 AM, then what time is it now?  
A) 11:00 AM    B) 11:40 AM    C) 4:00 PM    D) 10:00 PM
8.  $2 - 13 - (-7) =$   
A) -18    B) -11    C) -8    D) -4
9. The number that is 5 less than the square root of 144 is 5 more than  
A)  $\sqrt{4}$     B)  $\sqrt{25}$     C)  $\sqrt{49}$     D)  $\sqrt{134}$
10. The product of a 3-digit integer and a 4-digit integer can have ? digits in all.  
A) 12    B) 8    C) 6    D) 5
11. The hour and minute hands of a circular clock form a  $60^\circ$  angle at  
A) 2:00    B) 3:30    C) 6:00    D) 9:45
12. The total number of primes between 24 and 42 is  
A) 3    B) 4    C) 5    D) 6
13.  $\frac{30 \times 25 \times 20 \times 15}{6 \times 5 \times 4 \times 3} =$   
A)  $5^4$     B)  $5^3$     C)  $5^2$     D)  $5^1$
14. 30% of 40 is equal to 40% of  
A) 200    B) 120    C) 60    D) 30
15. An equilateral triangle and a square have the same perimeter. If the length of a side of the triangle is 8, what is the area of the square?  
A) 16    B) 24    C) 36    D) 64



- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.

16.  $\frac{1}{2} \div \frac{3}{8} =$   
A)  $\frac{3}{16}$     B)  $\frac{2}{5}$     C)  $\frac{5}{8}$     D)  $\frac{4}{3}$
17.  $3^4 + 3^4 + 3^4 =$   
A)  $3^5$     B)  $9^4$     C)  $3^{12}$     D)  $9^{12}$
18. Eli's goal was to lift 3.5 kg during his workout, but he was able to lift only 3 kg. What fraction of his goal weight did Eli lift?  
A)  $\frac{1}{7}$     B)  $\frac{2}{3}$     C)  $\frac{3}{4}$     D)  $\frac{6}{7}$
19. Of the following, which is the largest?  
A) 0.02    B)  $\frac{1}{20}$     C) 4%    D)  $\frac{3}{100}$
20. The perimeter of square A is twice the perimeter of square B. The area of square A divided by the area of square B is  
A)  $\frac{1}{2}$     B) 2    C) 4    D) 8
21.  $13.25:1 = \underline{?}:8$   
A) 53    B) 106    C) 122    D) 150
22. Of the following, which has the smallest reciprocal?  
A)  $\frac{2}{5}$     B)  $\frac{3}{7}$     C)  $\frac{4}{3}$     D)  $\frac{9}{4}$
23. At a certain school, there are 2 teachers for every 15 students. How many teachers are there if there are 165 students?  
A) 11    B) 13    C) 17    D) 22
24. The cost of 3 apples and 4 oranges is \$4. If 2 oranges cost half as much as 1 apple, then the cost of 2 apples is  
A) \$1.00    B) \$1.50    C) \$2.00    D) \$2.50
25.  $10^{2010} - 1$  is divisible by  
A) 10    B) 11    C) 12    D) 15
26. 250% of ? is 30.  
A) 12    B) 45    C) 70    D) 75
27.  $2.01 \times 10^{2009} = 2010 \times \underline{?}$   
A)  $10^{2006}$     B)  $10^{2007}$     C)  $10^{2012}$     D)  $10^{2013}$
28. How many prime numbers are divisible by 2?  
A) zero    B) one    C) three    D) ten
29. As shown, two small circles pass through opposite endpoints of a diameter of a large circle and touch once at its center. If the large circle's area is  $16\pi$ , then the shaded region's area is  
A)  $4\pi$     B)  $5\pi$     C)  $6\pi$     D)  $8\pi$



- 16.
- 17.
- 18.
- 19.
- 20.
- 21.
- 22.
- 23.
- 24.
- 25.
- 26.
- 27.
- 28.
- 29.

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